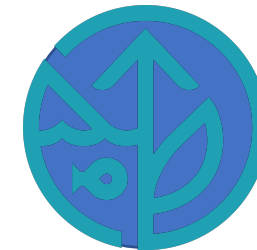




Cavender-Bares—Mapping temperate forest diversity and disease



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1. Disease pathogens that infect trees have had devastating impacts on North American forests.
 2. To contribute to enhanced forest management, we are using satellite, UAV and leaf-level spectroscopic data to map temperate forest species and detect disease, with a focus on the oaks (*Quercus*). The oaks rank among the most important tree lineages in the northern hemisphere comprising nearly 30% of temperate forest biomass in the U.S.
 3. The oak genus is under threat from multiple pathogens. The oak wilt fungal pathogen (*Bretziella fagacearum*) is the most lethal threat. Critical gaps remain in accurate detection of the disease and in differentiating it from other diseases.
 4. Using AVIRIS NG airborne imagery and a stepwise phylogenetic approach, we are able to detect oak-wilt infected trees and link remotely detected symptoms to the physiological progression of the disease.
 5. We are developing approaches for mapping forest temperate diversity—to both detect and predict community composition and the diseases that impact individual lineages—using airborne and satellite spectroscopic imagery.